



Experience and Lessons-learned in Applying the Tri-Service Assessment Initiative Process

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Overview

- Description of the experience and lessons-learned as a result of applying the Tri Service Assessment process to an acquisition organization within NAVSEA (PEO IWS née PEO TSC)
 - IWS = Integrated Warfare Systems
- Focus on the specific challenges encountered
 - and the process adaptations made to ensure the assessments were successful
- These recommendations are pragmatic
 - Tips to make things better
- This briefing does not summarize the technical findings
 - but rather focuses on how they were achieved

Why assessments?

- At certain times, for certain programs, assessments are necessary to
 - Check for latent surprises
 - Accelerate process improvement planning
 - Identify problems and root causes
 - Facilitate budget and resource planning
 - Assess risk for upcoming events (e.g., OPEVAL)
 - ...
- Use of assessments has proved to be a valuable tool to assist in acquiring software-intensive systems
- But assessments must be carefully conducted to achieve maximum utility

Why TAI process was selected

□ Key features

- Pre-defined, well-used process

- Network of independent experts available to serving on assessment teams

- Cross-service perspective (*"How did they solve it?"*)

□ Overall goal for conducting assessments:

- Evaluation and improvement of the software processes used by programs within the PEO

- Identification of weaknesses and strengths

- Determination of risk and risk mitigation strategies

- Establishment of software guidance to raise level of development quality



Purpose of assessments

- Prepare for CEC OPEVAL by ensuring no unpleasant surprises were lurking – assess the five core systems that use CEC as a means for track sharing
 - » **CEC** - Cooperative Engagement Capability
 - » E2C - NAVAIR program
 - » **ACDS** - Carrier Self Defense System
 - » **Aegis 6 Phase 1**
 - » **C2P** - Command Control Processor - SPAWAR - PMW 159
- Three separate organizations are represented among these systems (NAVSEA, NAVAIR, and SPAWAR)
- Four of the five programs were assessed
- *(Subsequently, an additional six programs have been assessed within the PEO)*



What we learned...

- The benefits to performing assessments are substantial

- Clear and timely snapshot of current state of program

- Roll-up of lessons-learned

- Direct assistance to the programs

But,

- Unless carefully performed, these benefits may be difficult to achieve

- There exist several pitfalls that can derail ability to derive value from assessments

- Team had to adapt to maximize effectiveness

Pitfalls

- 1 "Slow roll" in scheduling interviews and site visits
- 2 Site visits causing disruption
- 3 Ankle biter reputation
- 4 "Fire hose" site visits
- 5 Missing important topics
- 6 "SW only" assessment
- 7 Extended assessment schedule
- 8 High-level and process-only
- 9 "Dump and run" syndrome
- 10 Multiple, unrelated issues
- 11 Late final reports
- 12 Unclear presentation of findings
- 13 Criticism causing defensiveness
- 14 Recommendations requiring excessive time

1 – “Slow roll” in scheduling interviews and site visits

- Being the subject of an assessment is never fun
 - Like going to the dentist
- Tendency is to delay it as long as possible
 - Blaming it on coordinating schedules
- Tasks that are important, however, seem to always get done
- Need to ensure that everyone has same sense of priority
- *Recommendations:*
 - Secure assurances from PM that assessment is of high-priority
 - Ensure that PM makes this clear to organizations being assessed
 - Assessment team members need to be flexible to accommodate reasonable schedule changes
 - Emphasize that very little staff time is really needed (see #2)
 - Define a schedule and follow it

2 – Site visits causing disruption

- q In all cases, encountered significant push-back from organizations being assessed – fear of disruption and delays
 - For a program in trouble, impact could be serious
- q Disrupting the progress of the program by performing the assessment is counterproductive
 - Often create more problems than those solved
- q Need to ensure a ripple-free process
 - and to set their minds at ease in advance

2 – Site visits causing disruption (cont'd)

□ Recommendations:

Schedule each person for no more than 1 hour for entire visit

- » Some individuals may require longer times
 - > POC, guides, etc...
 - > Keep to a minimum

Plan interviews based on organization chart – functions and people

- » Rather than by topic

Use this approach to assess communications across organization

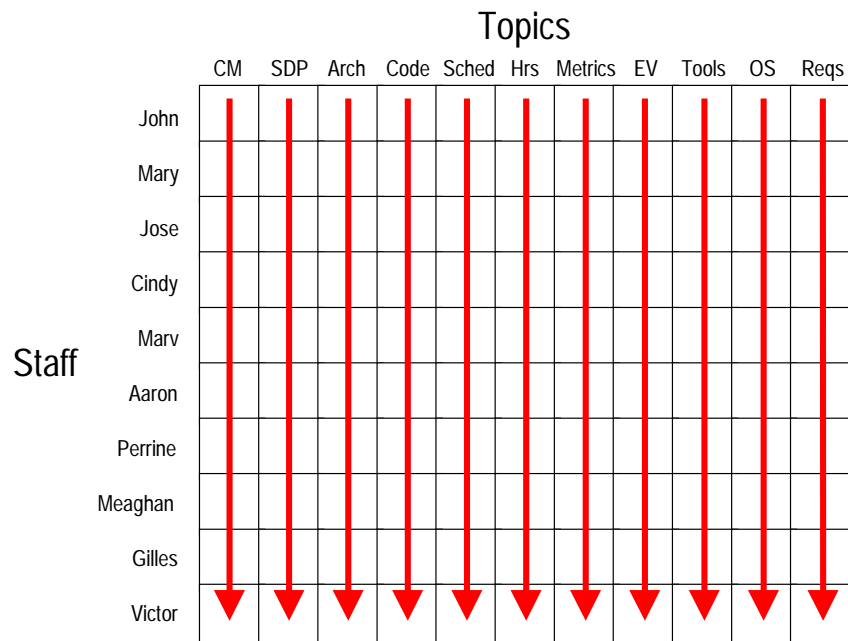
- » A key problem in many programs

Request that no special materials/briefings/etc. be prepared for the site visits

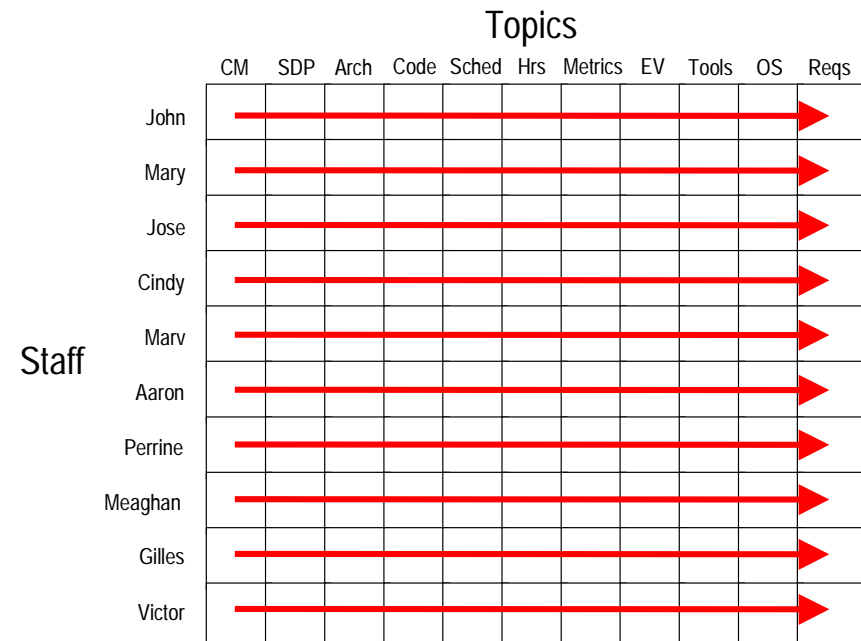
- » Ensure fidelity of snapshot - minimize Heisenberg effect

Recommended interview schedule approach

Easier for interviewers



Easier for interviewees



3 – Ankle biter reputation

- Typically, programs react with fear that an assessment is coming
 "Not more help!"
- If the assessors leave the impression that they are there just to criticize, the staff will be uncooperative
 Crucial information will not be forthcoming
 and the word will spread
- *Recommendations:*
 - During interviews
 - » Always be supportive
 - » Just collect information, make no judgments
 - » Encourage dialog, let them talk
 - During briefouts
 - » Ensure balance of findings (favorable and unfavorable)
 - » Emphasize that all programs have room for improvement

4 – "Fire hose" site visits

- q Lots of data is presented during interviews
- q The data is not organized according to topic (see # 2)
- q Much is repetitive
- q This "fire hose" situation may result in information being lost
 - Need to organize and assimilate
- q *Recommendations:*
 - Each team member should take note of findings and tentative conclusions as interviews progress
 - » Don't wait until later
 - Leave 15 min or so between witnesses to allow for soak-in time and discussion
 - Teams should caucus privately at least once per day to collect thoughts and compare findings

5 – Missing important topics

- q Assessments that do not touch all important topics may miss critical issues and may fail to reinforce good practice
- q Too much time spent on ensuring total coverage will skim over key topics and not permit sufficient depth
- q *Recommendations:*
 - Use the TAI information model to help structure topics
 - Make a list beforehand that includes relevant topic areas
 - » Assign team members to ensure topics are covered
 - Rely on team experience to determine topics to cover and skip
 - Ask interviewees what their view of important topics is
 - » Often those closest to the fire know where the heat is
 - » Be willing to stroll down unexpected paths

6 – "SW only" assessment

- If advertised as a "SW only" assessment, the results may be ignored as being irrelevant

"It doesn't affect me - I do systems."

- If limited to a "SW only" assessment, the results may actually be irrelevant

Rarely is SW the prime cause of problems, although a common perception is that SW is where the problems reside

- *Recommendations:*

Be clear about the assessment's focus on software

» "...plus all factors that affect the ability of the SW developers to do their job"

Ensure that non-SW factors are considered in the assessment

7 – Extended assessment schedule

- q An extended assessment schedule will
 - Dilute findings
 - Likely to be inaccurate as program evolves
 - Have reduced impact
- q Often this is a big challenge
 - Blending schedules is often very hard
 - Unwillingness to prioritize assessment may be a finding itself
- q *Recommendations:*
 - Keep site visits to within a week max for each site
 - Emphasize importance of keeping things moving
 - Be willing to proceed with subset of assessment team
 - Be willing to be flexible about missing some key players
 - Do not let activity stretch out – place high priority on getting it done

8 – High-level and process-only

- q Assessment reports that are high-level and focus solely on process are likely to be viewed as being impractical and may very well be
- q Ignoring the details can blur understanding the big picture
- q Hand-waving level not likely to result in real change
 - Too far removed from worker-level
- q Yet often high-level recommendations have the most lasting impact
- q *Recommendations:*
 - Ensure low-level information is collected and appropriately reported
 - Correlate process findings with objective artifacts
 - Be specific about findings and recommendations – use details to demonstrate global issues

9 – "Dump and run" syndrome

- Characterized by team's delivering final report to PM and then disappearing
- Will not have a lasting impact
 - Reports often need additional explanation
 - Recommendations often need cultivation and continued attention
 - Results need to be briefed to PO and Contractor staff
- *Recommendations:*
 - Do not disappear after presentation of final report
 - Encourage PM to allow report to be presented to developers /contractors/ labs
 - Create Transition Plan to ensure continued support:
 - » Make some subset of team available afterwards for specific guidance
 - » Transition to dedicated team for implementation

10 – Multiple, unrelated issues

- q Reporting multiple, unrelated issues will
 - Present a confused picture of the state of the program
 - Delay being able to identify root causes
- q Need cohesive views to see totality of program
- q "In the weeds" perspective can miss important lessons
- q *Recommendations:*
 - Ensure team has sufficient time to mull over findings and observations
 - Look for common causes and fixes
 - Categorize findings into logical bins
 - Analyze cause-effect relationships
 - Organize according to recommendations rather than symptom
 - » Focus on proactive solutions

11 – Timely final reports

- Once a program is convinced that an assessment is a good idea, they become anxious to get results
- For optimum benefit, final reports are needed promptly so that recommendations can be put into place
- Delayed reports are likely to be ignored, and may have little practical impact
- *Recommendations*
 - Brief sites on initial observations before leaving
 - » But do not brief any conclusions of recommendations
 - Prepare report as a briefing
 - » Formal narrative reports take too much time
 - Ensure all parties are briefed as soon as possible

11 – Timely final reports (cont'd)

□ *Recommendations (cont'd):*

Do not include all findings and conclusions – prioritize

Focus on high-leverage recommendations

Do not obsess about providing all details – consider the "elevator" speech

12 – Unclear presentation of findings

- q A lack of a clear presentation of findings may result in a compromised message and excessive defensiveness
- q Can occur if report is too long and detailed
- q Risk that recommendations will be misunderstood and ignored
- q Indication that issues may not be fully understood by assessment team (*worst case situation*)
- q *Recommendations:*
 - Provide adequate caucus time for team to review notes and observations
 - Ensure that issues are clearly stated and are appropriately grouped
 - » Provide details as clarification but as sub-bullets
 - Recommendations should be directly actionable
 - Leave time for independent review of report
 - Continue to apply the "elevator rule"

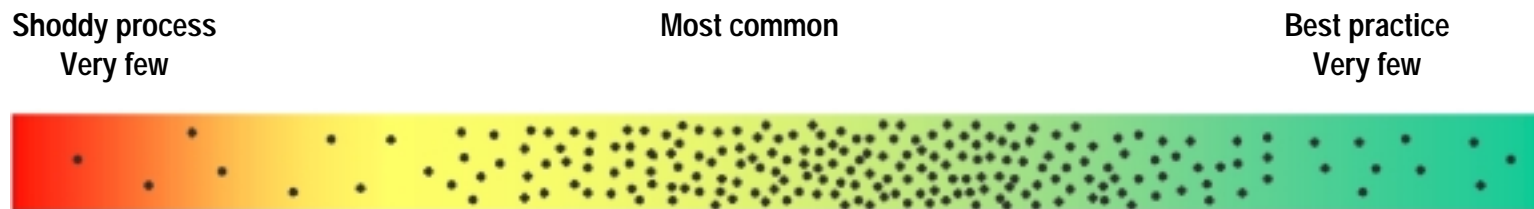
13 – Criticism causing defensiveness

- Reports filled with criticisms likely to result in a defensive posture by the program being assessed
 - Yet, criticisms are unavoidable
- Briefing such reports will degrade into arguments and sides being taken
- Impact is loss of audience and failure of assessment
- *Recommendations:*
 - Balance the criticisms with praise (not arbitrary but justified)
 - Emphasize that every project has room for improvement
 - State clearly that the results are just for their own use
 - Ensure reports are not personal by focusing on technical aspects
 - Sometimes, a harsh message is necessary however

Interpretation of Results

Sample foil to calibrate
reception of results

- Most assessments report areas for improvement
 - Nature of software practice
 - Everyone can improve
- However, most organizations do most things right
- Many problems caused by external factors out of developers' control
- All SW development organizations have room for improvement
 - Regardless of CMM level
- Goal is to raise quality level of software practice



14 – Recommendations requiring excessive time

- q Sometimes, obvious and important recommendations require time to implement
 - Long-term investment and payback
- q However, needs of programs often have shorter time-lines
- q Platitudes and generic fixes often are moot
 - May be correct but irrelevant
 - May be of little utility
- q Often tied to root causes
- q *Recommendations:*
 - Include focus on actions that can be applied immediately
 - Ensure that expectations for benefits are not exaggerated
 - Admit if short-term fixes aren't enough

Conclusions

- Use of assessments can be a valuable and cost-effective management strategy
- Assessments help
 - to identify and mitigate risk
 - to identify areas for improvement
 - to promulgate lessons-learned so that future programs don't make the same mistake
- To gain maximum benefit, they must be conducted carefully and with proper planning